

ECE 253F – Digital and Computer Systems

Fall 2012 S.D. Brown

Instructor and Lecture Information

Instructor	Stephen Brown	
Office	PT484C (Pratt building, 4th floor)	
Phone	416-978-1647	
Email	brown@eecg.utoronto.ca	
Office Hours	Arrange meetings in class or by email	
Lecture Rooms/Times	L0101	L0102
	M 11-12 (BA 1180)	M 12-1 (BA 1180)
	W 1-2 (BA 1180)	W 12-1(BA 1180)
	F 11-12 (BA 1180)	F 10-11 (BA 1170)

Grading

Labs 20%	Midterm 25%	Exam 55%
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Midterm

Thursday November 1st, time TBA

Exam

Type D – examiner specified aids: **One 8.5” x 11” two-sided aid sheet. No textbooks will be permitted (closed book exam). No calculators, no cellphones.**

Suggested Text

This course uses a Custom Textbook for ECE 253 that is available online. This book takes chapters from **Fundamentals of Digital Logic with Verilog Design, 2nd Edition**, by Brown & Vranesic, McGraw Hill, and **Computer Organization and Embedded Systems, 6th Edition**, by Hamacher, Vranesic, Zaky and Manjikian, McGraw Hill). The book can be found by searching for ECE 253 on www.mcgrawhillcreate.com/shop. Make sure to select Canada as your country before doing this search.

Computer Required to Run CAD Software at Home

You'll need a computer running Windows 7 or XP to run the software needed in this course at home. If you do not have this class of computer, you will be able to use the University's machines instead. See the information below on CAD software to see how to obtain the software for your computer.

ECE253F - Digital and Computer Systems - Lab Information

The real learning in this course goes on in the laboratory where you design, build and test and fix real circuits, as well as program a small processor. There are nine labs of three hours each, and so you will have one 3-hour lab every week. You will work in groups of **two**.

There are two parts to the lab experience: preparation, which you must do outside of the lab hours, and the actual implementation of circuits and software in the lab.

Preparation

Each lab usually requires you to do significant amount of preparation, and is where you must do much of the work to understand the concepts. Preparation must be complete before the lab begins. It will usually require design work using the CAD software supplied as well as the assembler software. **Each partner in the group of 2 must perform and submit a separate preparation.** While it is acceptable to discuss your preparation with your partner, your work may not be copied from your partner; you will be required to explain your preparation. Please be aware that severe penalties will be imposed for copying of labs, as evidenced by an inability to explain the work given as preparation. It will be graded by the TAs at the beginning of the lab, on the following basis:

Judgment of TA	Grade
Unable to explain any part of preparation	0
Some merit to work	1
Made a legitimate attempt	2
Reasonable job, may be some missing things	3-4
Correct and Done well, demonstrated clear knowledge of subject.	5

In-Lab Work

In each lab you will have to typically build a working circuit or make a working program. Once this is done, for each such circuit/program, show it to your TA for grading, out of 5:

Judgment of TA	Grade
Did not attend or try	0
Tried, but failed to get much working	1
Small amount working	2
Significant portion working	3
All but a little working	4
Everything worked	5

Note: Although the lab portion of the course is worth 20% of the course grade, both the midterm and the final exam may contain questions directly related to skills learned in the lab.

Lab Workstation Number and Maintenance

Each digital workstation that you'll be sitting at has a number. Please use the same station each week. If a piece of equipment is not working, please tell a TA to tag the board with the problem and notify someone to have it repaired. Otherwise it will be broken the next time you need to use it!

Lab Sections, Day Time and Location

Section	Day	Time	Location(s)
1	Tuesday	9am-12pm	BA 3135/45/55
2	Thursday	2-5pm	BA 3135/45/55

First Lab Days

Tuesday September 18th, or Thursday September 20th, 2012.

Access to Software Used in This Course

The lab in this course depends heavily on the use of commercial software for both design circuits and compiling software into a processor. We will be using Altera's **Quartus II Version 11.1 SP2** Web edition software, and the associated Nios II development tools. This software is free. Note that this is **not** the latest version of the software; we want to use the slightly older version because it has all of the features needed and is known to be stable. You will be able to access this software in one of three ways:

1. On your own home computer.

This software requires a modern Windows 7 or XP-based computer.

You will need to download and install the software from Altera's website. Before doing so, you will have to create a 'myAltera' account by filling out an online form on Altera's web site. This form asks for your name and address. You can use 'The University of Toronto' as the company, and the address '10 King's College Rd, Toronto, Ontario, Canada M5S 3G4' as the address if you do not wish to use your own. Once you have acquired this account, download the software below (you only need the 1st download for the first 5 labs of the course):

- i. Quartus II 11.1 SP2 Web edition

<https://www.altera.com/download/archives>

The following software will be necessary for labs 6 through 9:

- ii. Nios II Embedded Design Suite, Version 11.1 SP2 for Windows
- iii. Altera Monitor Program

<http://www.altera.com/education/univ/software/monitor/unv-monitor.html>

2. On the Windows Machines in the lab – Bahen 3125, 3135, 3145 and 3155

There are about one hundred computers in these Bahen Centre labs, which will have the same software listed above installed. These machines will have access to your home directory on the ECE ugsparc system.

3. On the ECF PC Systems

Quartus II is available on the ECF Windows PC systems.